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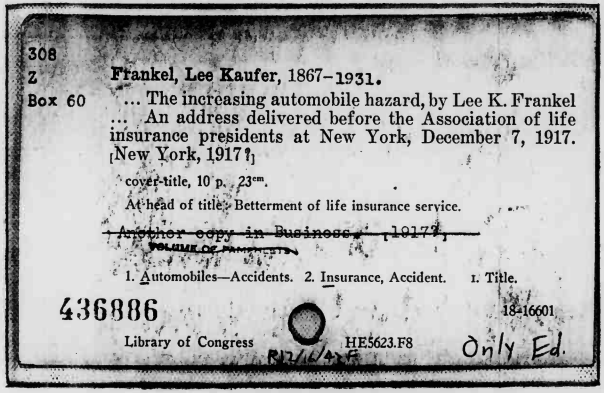

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Betterment of Life Insurance Service

THE INCREASING AUTOMOBILE HAZARD

BY
LEE K. FRANKEL, Ph.D.
Third Vice President, Metropolitan Life Insurance Co., New York

An Address delivered before
THE ASSOCIATION OF LIFE INSURANCE PRESIDENTS
At New York, December 7, 1917

THE INCREASING AUTOMOBILE HAZARD

By Lee K. Frankel, Ph.D.

Third Vice President, Metropolitan Life Insurance Co., New York

AN ADDRESS DELIVERED AT THE ELEVENTH ANNUAL MEETING OF THE ASSOCIATION OF LIFE INSURANCE PRESIDENTS IN NEW YORK CITY ON DECEMBER 7, 1917

The increasing importance of the automobile as an instrument of injury and death is daily being viewed with greater alarm by life insurance companies, police officials, civil authorities and public health administrators. Vital statisticians are observing that while the communicable diseases have responded more and more each year to the measures instituted by health authorities for their control, injuries and fatalities resulting from the growing use of automobiles are steadily climbing. Where formerly diseases like typhoid fever, scarlet fever and others played an important rôle in mortality tabulations, fatalities due to the automobile are to-day as numerous as some of the serious infections.

What this increasing incidence of automobile fatalities means to life insurance companies is indicated by the industrial experience of the Metropolitan Life Insurance Company. In an exposure of more than ten million lives annually the death rate from automobile accidents has more than trebled since 1911. In that year the death rate from this cause was 2.3 per hundred thousand; in 1916 it had increased to 7.4 per hundred thousand.

During this six year period the rate for each year was markedly higher than the rate for the preceding year. The rate for 1916 showed an increase of more than 37% over 1915. The figures for the first ten months of 1917 indicate a considerable increase over the totals of 1916. These figures do not reflect an isolated experience but are representative of what is going on in the country generally, especially in the urban centers of population. The data available show clearly that we have before us a problem of the first magnitude and that we must organize all communal groups interested in public safety to combat the growing evil. It will be

necessary to interest legislatures and to educate the public generally if we are to control the results of the automobile industry which has grown so tremendously in recent years.

REGISTRATION

The increase in the number of automobile accidents and fatalities bears a definite relation to the increase in the number of automobiles in use. The development of the automobile is a matter of common memory. The last decade has seen the automobile reach a condition of practical utility to permit its general use. It is estimated that in 1907 there were approximately 150,000 motor vehicles of all types in use in the United States. In 1911 the number of cars registered amounted to 677,000. In 1916 registrations had increased to more than three and one-half millions. On July 1, 1917, the number was very close to four and one-quarter millions. The annual rates of increase have varied somewhat from year to year. In 1912 it was 49% over the preceding year; in 1916 it was 43% over 1915. The indicated rate of increase in 1917 is about 40% over 1916. Apparently we have not yet reached the diminishing rate.

PRODUCTION

In 1911, there were 210,000 motor vehicles manufactured in the United States; in 1916, 1,617,708, or an increase of 770%. The increase of 1912 over the previous year was 80%; for 1913 it was much less, 28%, and for 1914, still less, 19%. In 1915, however, it was 56%, and the increase of 1916 over 1915 was 89%; this was greater than the increase for any previous year. The estimate for the first six months of 1917 is only about half the 1916 production. Many of the factories are already operating on a reduced schedule. There is, however, no reason to believe that the saturation point of the automobile market has been reached—there are thousands of new car owners coming into the domestic market every year, and our foreign trade is growing. Under the new conditions brought about by the war, factories may be transferred to the Government for war use. We may, therefore, expect a temporary decline in the rate of production during the next few years. Perhaps this slowing up in the production of motor vehicles will have its counterpart in a slowing up in the increase in the accident rate which we have been observing.

HAZARD DUE TO TYPE OF VEHICLE

A study of automobile accidents and injuries leads to a consideration of the various types of vehicles. Experience has shown that the type of car operated makes a marked difference in the hazard. According to the reports of the Massachusetts Highway Commission, motor trucks and commercial vehicles caused 50% more accidents per vehicle than any other class of machine. In New York City motor trucks and commercial vehicles form less than 25% of the number of machines registered. The Annual Report of the Police Department for the Year 1916 shows that the number of deaths caused by trucks and motor delivery machines was almost 40% of the total deaths (132 out of 335). It is obvious that the motor truck is the more dangerous type of machine. It is of interest to observe that in the country at large the number of commercial vehicles still forms but a small part of the total number of automobiles in use, approximately 11%. The increasing use of the automobile for commercial purposes presents a very distinct source of future hazard which should receive especial attention.

THE PROBLEM LARGELY AN URBAN ONE

We have already referred to the increasing mortality rates from automobile accidents as shown by the industrial experience of the Metropolitan Life Insurance Company. It is interesting to note that these figures are almost identical with those for the general population of the country as reported by the Bureau of the Census. In 1916 there were in the Registration Area of the United States 5,173 deaths from automobile accidents, corresponding to a death rate of 7.3 per 100,000 population. In 1911 the rate was 2.2 per 100,000 or less than one-third the present rate. In 1915, the last year for which detailed figures are available, the rate was 5.9 per 100,000. For the cities in Registration States, however, the rate was 7.6 per 100,000, while in the rural areas of these States the figure was only 3.9 per 100,000 or just about half the urban rate. We are concerned, therefore, with what is primarily an urban problem. This is shown by the following tabulation of rates for some of the principal cities of the country for the year 1916, compiled by the Prudential Insurance company:

	Deaths per 100,000
U. S. Registration Area	7.3
Nine American cities	8.7
New York	7.2

	Deaths per 100,000
Chicago	10.0
St. Louis	9.1
Baltimore	5.1
Buffalo	12.2
San Francisco	13.6
Providence	10.2
Newark	13.4
Washington	9.9

The higher rate in urban centers is borne out by the experience of the Metropolitan Life Insurance Company, as shown by the following figures:

MORTALITY IN 1916 FROM AUTOMOBILE ACCIDENTS
Metropolitan Life Insurance Company
Industrial Experience

	Deaths per 100,000
Total Company experience	7.4
Ten largest cities combined	8.4
New York	8.1
Chicago	10.0
Philadelphia	9.6
St. Louis	6.3
Boston	6.4
Cleveland	9.3
Baltimore	4.1
Pittsburgh	9.1
Detroit	13.9
Los Angeles	17.0

These figures should be taken with reserve as there are no available municipal data in reference to the ratio of automobiles to population. The statistics compiled by "The Automobile" show the following State ratios of population per car for the States in which the above cities are located:

States	*Population per car*
New York	30
Illinois	22
Pennsylvania	34
Missouri	27
Massachusetts	28
Ohio	18
Maryland	29
Michigan	16
California	12
Rhode Island	24
New Jersey	30

The above experiences of the Metropolitan, of the Registration Area and of certain cities as compiled by the Prudential, give only fatal injuries. There is, however, a very important source of social loss in the large number of more or less serious non-fatal injuries which result from automobile accidents. This is brought out by the experience of the Travelers Insurance Company and by the reports for the State of Massachusetts and the City of New York.

In 1906 the Travelers paid only 301 claims to policyholders for accidents while riding in or driving an automobile. In 1916, the number was 2,535, an increase of 742%. This is significant in view of the fact that accident claims from all other causes—a great many of them occupational—increased only 46%. The experience of the Travelers, based on the insurance of male lives, shows that one out of 136 accidents results fatally. This experience includes all forms of minor and major accidents.

According to the reports of the Massachusetts Highway Commission, one out of 30 known automobile accidents in 1916 was fatal. In the same year in New York City, one out of every 22 was fatal. These figures indicate incomplete reporting of accidents to the city and State authorities. Hundreds of personal injuries occur which are not reported to the police, but which add materially to the seriousness of the automobile hazard.

The New York City Police Department has kept detailed records of traffic accidents for nearly three years. Reports at hand indicate the same upward trend of the motor vehicular rate. In 1915 there were 6,663 persons struck by motor vehicles of all kinds—passenger, truck, delivery and motor cycles: in 1916, this number was 8,071, an increase of about 21%. For the first ten months of 1917, there were reported 9,004 cases of death or injury as the result of motor vehicular accidents, an increase of 12% over the figure for the entire previous year.

There has been some consolation in the fact that, though fatal accidents are increasing at an alarming rate, they are not keeping pace with the rate of increase in motor vehicle registration. While the number of automobiles registered in the United States increased 423% during the period 1911 to 1916, the fatal accident rate increased only 232%. The report of the Massachusetts Highway Commission shows, however, that the increase in non-fatal accidents was greater than the increase in registration. Non-fatal injuries in Massachusetts increased 632% during the period 1911 to

1916, while registration increased only 247%. In the same period the fatal accident rate showed an increase of 186%.

CAUSES

Accidents, whether to occupants of the automobile or to pedestrians, are due to a variety of causes. The 1916 experience of the Travelers, limited to occupants, shows that cranking is responsible for the greatest number of accidents. These may be expected to show a gradual decrease owing to the more general use of self-starters. Collisions ranked next in numerical importance, followed by accidents while caretaking or repairing, skidding or ditching, entering or leaving the car, and operating. Compared with 1915, the 1916 experience shows an increase in accidents due to skidding, ditching and collisions, which result as a rule in more serious disabilities.

Accidents to pedestrians may be the result of (1) speeding or carelessness on the part of drivers; (2) carelessness on the part of pedestrians; (3) defects in motor vehicles; and (4) improper construction and condition of roads and streets. Frequently it is difficult to determine the cause, or fix the responsibility. The policeman or other official who makes the report is seldom an eye-witness to the accident. His story will, in most cases, be second-hand. If either of the parties concerned, the driver or the injured person, makes the report, the version will naturally depend upon the point of view. Ordinary observation, however, will convince one that the driver is often careless or incompetent, that the pedestrian takes many chances and that there are cases in which neither driver nor pedestrian can be held at fault.

A consideration of the 675 accidents studied by the Massachusetts Highway Commission shows that 16% of the cases were those in which the speed was excessive. Over two-thirds of these cases were in city streets. In 6% of the Massachusetts cases the operators were believed to be intoxicated. This makes a total of 22% in which the operators were clearly at fault.

In New York City the vast majority of automobile accidents occurred at street intersections or crossings. It is significant that 210 accidents out of 7,861 in 1916 occurred in safety zones, isles of safety, at car stops, in front of schools, or on sidewalks in which pedestrians were not at fault.

On the other hand, we find that in more than one-half of the Massachusetts cases in which pedestrians were either killed

or injured, accidents would not have occurred if the ordinary precautions had been taken of looking before crossing. In 265 fatal accidents the injured were wholly at fault in 162 cases and partly to blame in 43; the operator was wholly at fault in 51 cases and partly to blame in 43. In 6 cases the facts could not be ascertained and in 3 the accident was practically unavoidable.

These figures are not surprising. Pedestrians are reckless and take chances. To prove this a study was made on Friday, November 23, at the corner of 4th Avenue and 23d Street from 4.45 p.m. to 5.15 p.m. During this half hour an investigator counted 924 persons who crossed on the south side of 23d Street, going east and west, after the traffic policeman's whistle had indicated that the north- and south-bound traffic had the right of way. Many of them dodged in and out between automobiles. At 5th Avenue and 33d Street, on Saturday, November 24, from 12 o'clock noon to 12.30, 610 persons crossed 5th Avenue, east and west, while automobiles were moving north and south, in obedience to the policeman's order. Narrow escapes were many and it is the wonder of the observer that not a single accident occurred. It is interesting to note in this connection that during the year 1916 only one automobile accident occurred at the 4th Avenue and 23d Street crossing and none at all at the 5th Avenue and 33d Street corner. This indicates care on the part of some one, but certainly not on the part of pedestrians.

Very few accidents are caused by defects in the motor vehicle. In Massachusetts less than 1% were attributed to this cause. It is probable that some of the New York City accidents in safety zones, etc., were caused by defects which robbed the operator of control of the machine.

Many accidents in New York City occur at street intersections, where streets cross at a diagonal, notwithstanding that usually there is a policeman at such points to regulate traffic. Another opportunity for accidents is offered when side streets entering a main highway are not opposite each other. These conditions are not easily remedied, but town planning commissions might well make note of them.

Congestion of traffic is perhaps the great underlying cause of the majority of highway accidents. The time at which accidents occur is the most telling proof that this is a big factor in the accident question. The Massachusetts Highway Commission found that many more accidents occur in the daytime

than at night; of the 675 cases studied 401 were in daylight and only 274 were in the dusk or after dark. New York City figures show that the highest accident rates per hour are between 3.00 and 7.00 p.m. There are more people walking or driving at these hours. More motor trucks are making deliveries in the afternoon. This has an important influence on the accident hazard and points to a simple means of prevention—utilization of the forenoon for deliveries; in fact, for most commercial work

The season at which automobile accidents occur in New York City is another evidence of the influence of congestion of traffic. In winters accidents are few—fewer automobiles are in use. In spring the rate rises—more cars are being driven. In summer many car owners are away, and the rate shows a decline. In the fall, during which congestion of traffic is greatest, the accident rate reaches its highest point.

AGE DISTRIBUTION

A discussion of the causes of automobile accidents would be incomplete without an analysis of the age distribution of the persons killed or injured. In the Metropolitan experience, out of 2,507 policyholders killed by automobiles during the period 1911 to 1916, 790, or 32%, were children under 10 years of age, and 1,125, or over 44%, were children under 15 years of age. It should be kept in mind, in connection with this experience, that those killed were nearly all pedestrians, since the experience includes only the industrial classes. It is also an experience largely confined to urban centers of population, in which play space for children is limited. In the Registration Area of the United States 772 deaths, or 19% of the total deaths from automobile accidents, were of children under 10, and 1,079, or 27%, were of children under 15. The New York City figures present a similar situation with regard to the non-fatal, as well as fatal, accidents. In 1916, 11% of automobile injuries and fatalities were of children under school age—6 years; 37% were of children of school age—between 6 and 16.

REMEDIES

The remedies which may be suggested to insure the prevention of a continued increase in fatal and non-fatal automobile accidents are

indicated by the statistical data already given. It is evident that the problem is primarily an urban one due to congestion of population and traffic in the larger cities. If accidents are to be reduced in number, more careful regulation of the driver, the pedestrian and the automobile will be necessary.

With respect to the driver every effort must be made to prevent and reduce the number of accidents caused by ignorance and inexperience of drivers. Such accidents are in part due to the ease with which it is possible to secure an operator's license particularly if the applicant is the owner of the machine. Provision should be made by statute under which any applicant for a license should be required by practical demonstration to prove his knowledge of the mechanism of an automobile and his ability to drive a car in traffic.

Statistics show that many accidents, particularly collisions, are due to violation of speed laws. It need only be added here that such infractions of law should be severely frowned on and punished to the fullest extent. Only by the imposition of heavy fines and imprisonment will drivers learn that laws are put on the statute books to be observed and not to be broken.

The problem of the pedestrian is a more complicated one and, yet, it is realized that there must be regulations of pedestrian traffic as well as of automobile traffic. The figures cited above show how reckless many pedestrians are and how frequently they are ready to take all kinds of chances. In Detroit and in Indianapolis attempts have been made to regulate pedestrian traffic. Individuals are liable to arrest for crossing streets after the signal has been given for traffic to go in the opposite direction, or for crossing streets outside of the so-called "white lines." The value of such ordinances lies not only in their punitive character but in their educational value. In time pedestrians, particularly in the larger cities, will realize that they also have obligations in the prevention of accidents. For the cautious pedestrian, additional isles of safety and safety zones should be provided.

A larger part of the pedestrian problem concerns itself with children, who are the most frequent victims of automobile accidents. The education of children in the schools regarding the need of greater care while in the streets is to be commended. It will, however, only partly solve the problem. If children play in the streets it is because they have no other places in which to play. Great reduction in the number of children's accidents will result through the extension of children's playgrounds and, where this is not possible, by the closing of certain streets dur-

ing certain hours of the day for the use of children. There is a splendid opportunity for architects to work out plans under which the roofs of tenement houses in cities like New York can be made available for play and recreation.

It is quite likely that the number of accidents due to faulty construction of the automobile will decrease through improvements which are being made in automobile mechanism. Whether automobiles can be so constructed as to permit of mechanical delimitation of speed capacity and, in particular, whether motor trucks can be equipped with fenders, are matters for the manufacturers to carefully consider.

Finally, in the planning of cities and towns, careful consideration should be given to proper construction of roads, so that skidding and ditching may be minimized as far as possible. Side streets which do not enter a main highway directly opposite each other should be eliminated as far as possible. Where congestion is heavy, the use of a large number of one-way streets will probably help to keep down the accident rate.

The remedies suggested only partly cover the situation. They have little bearing on the rural phase of the problem. Their value can be demonstrated only when we have the closest cooperation of legislators, police authorities, the public schools and the public generally in enforcing them.

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